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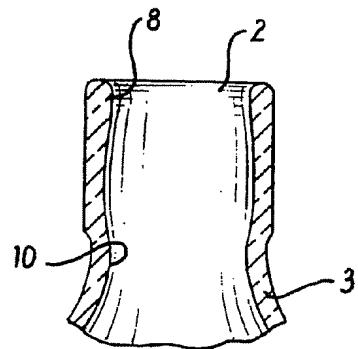
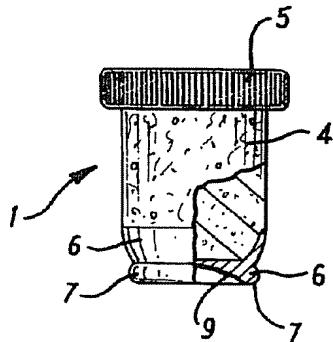
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(54) Closure for an opening in a container.

(57) A closure for an opening in a container is described. The closure (1) comprises a body portion (4, 5) which comprises a cork material. A protective portion (6) is located at an end of the body portion. The body portion (4) is adapted to retain the closure in the opening and the protective portion (6) engages with the inside surface of the container to substantially prevent the contents of the container contacting the body portion (4) of the closure (1).



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The invention relates to a closure for an opening for a container and in particular, but not exclusively, a stopper such as a cork for a bottle.

Currently, cork-type stoppers are used as the bottle seal, with the cork actually sealing the bottle and holding the stopper in place by the interference fit which the cork has in the mouth of the bottle. However, generally a bottle mouth has the most effective seal region nearest to the opening of the bottle where the diameter of the bottle mouth is smallest, and this is normally referred to as the choke or bite. The rounded or chamfered end of the cork is exposed to the bottle contents and may cause cork/product interaction which may adversely affect the product.

It is currently the practice to size a cork so that it is compressed by about 7% when inserted into a bottle. While this compression tends to overcome the profile and cork mouth diameter variation, the end of the cork is still exposed to the product.

In addition, conventional corks have the problem that it is often difficult to ensure that the cork is clean and free of yeast, mould, bacteria and residual processing chemicals. There is also the problem of ensuring that no cork disintegration or cork seed contaminates or discolours the product in the bottle.

In accordance with the present invention, a closure for an opening in a container comprises a body portion comprising a cork material, and a protective portion; wherein the body portion is adapted to retain the closure in the opening and the protective portion substantially prevents the contents of the container contacting the cork material of the closure.

Preferably, the resilience of the cork material holds the closure within the container.

Preferably, the container is a bottle and the closure is adapted to fit into the mouth of the bottle.

Preferably, the protective portion comprises a resilient material such as rubber or a synthetic rubber, or a plastic, elastomeric or plasto-elastomeric material and typically, the material is substantially non-reactive with the contents of the container.

Typically, the protective portion is on the innermost end of the closure. The protective portion may comprise a seal profile which engages with the inside walls of the container.

The seal profile may be designed so that as the closure is forced into the opening in the container, the pressure within the container forces the seal into sealing engagement with the inside wall of the container.

Typically, the cork material is adapted to be compressed by the opening in order to hold the closure within the opening and typically, the compression may be between 1 mm and 7 mm. Preferably, where the closure is double-ended, for example for a wine bottle, the compression is in the region of 6 mm, and where the closure has a cap on the outer end, for example for a whisky or other spirit bottle, the compres-

sion is in the region of 1.5 mm.

In one example of the invention the protective portion may further comprise a biasing means to bias the seal portion into engagement with the inside walls of the container.

The protective portion may be provided on the body portion by a coating technique or alternatively, by forming the sealing portion separately and attaching or bonding the sealing portion to the body portion.

Typically, the innermost end of the closure may be rounded or chamfered in order to facilitate insertion of the closure into the opening.

Preferably, the body portion is formed from cork material so that the cork material contacts the container. However, alternatively the cork material could have a coating or covering of non-cork material which contacts the container.

Typically, the protective portion may be designed to permit radial compression of the section of the protective portion on the end of the closure as the body portion is compressed. Typically, this may be provided when the compression is relatively high, for example, greater than 2 mm, but could be used even when the compression is low, for example less than 2 mm.

Examples of a closure in accordance with the invention will now be described with reference to the accompanying drawings, in which:-

Fig.1 is a cross-sectional view through a first example of a stopper and a bottle mouth into which the stopper is to be inserted;

Fig. 2 is a partial cross-sectional view through a second example of a stopper;

Fig. 3 is a partial cross-sectional view through an end of a third example of a stopper;

Fig. 4 is a partial cross-sectional view through an end of a fourth example of a stopper;

Fig. 5 is a partial cross-sectional view through an end of a fifth example of a stopper;

Fig. 6 is a cross-sectional view through a sixth example of a stopper;

Fig. 7 is a cross-sectional view through a seventh and eighth example of a stopper;

Fig. 8 is a cross-sectional view through a ninth example of a stopper;

Fig. 9 is a cross-sectional view through a first example of an end of a wine cork; and,

Fig. 10 is a cross-sectional view through a second example of an end of a wine cork.

Fig. 1 shows a stopper 1 which is adapted to be inserted into a mouth 2 of a bottle 3. The cork 1 comprises a body portion 4 of a cork material which has a cap 5 bonded to it at one end and a protective portion 6 at the opposite end. The protective portion 6 comprises a seal profile 7 and a concave surface 9.

Typically, the protective portion 6 may be manufactured from a natural rubber material, or a synthetic plastic, rubber elastomeric or plasto-elastomeric material. The protective portion 6 may be coated or

moulded onto the end of the body portion 4 so that the protective portion 6 is attached to the body portion 4 in the same operation as the formation of the seal profile 7 of the seal portion 6. Alternatively, the protective portion 6 may be manufactured separately, for example by a moulding process and then subsequently bonded to the end of the body portion 4, for example by use of an adhesive.

When the cork 1 is inserted into the mouth 2 of the bottle 3 the body portion 4 is compressed by the inside surface 8 of the bottle mouth to hold the stopper 1 within the mouth 2 of the bottle 3 the profile 7 engages with and seals with the portion 10 of the inside wall of the bottle mouth 2. Hence, the compression of the body portion 4 holds the stopper 1 within the mouth 2 of the bottle 3 and the protective portion 6 helps prevent the contents of the bottle 3 coming into contact with the cork material of the body portion 4.

Alternative examples of a stopper are shown in Figs. 2 to 8.

Fig. 2 shows a stopper 11 in which the protective portion 6 has a profile 20 which is more angular than the profile 7.

Fig. 3 shows the end of a stopper 12 in which the profile 21 of the protective portion 6 is similar to the profile 7 except that the profile 21 is adjacent the end of the body portion 4.

Fig. 4 shows a stopper 13 in which the protective portion 6 has a profile 22 which is similar to the profile 20 of the stopper 11 in Fig. 2 but the concave section 9 is omitted from the protective portion 6.

Fig. 5 shows a fifth example of a stopper 14 in which the protective portion 6 has a profile 22 similar to the profile 22 in Fig. 4 but the thickness of the protective portion 6 is greater which permits greater resiliency.

Fig. 6 shows a sixth example of a stopper 15 provided with a protective portion 23 which includes a central peg 24 which is inserted into a recess 25 in the cork material of the body portion 4 and is secured against withdrawal by an adhesive filler 26. The stopper 15 may be provided with either a plastic or wooden top 5.

Fig. 7 shows a seventh example of a stopper 16 on the left-hand side of the central line of Fig. 7 and an eighth example of a stopper 17 on the right-hand side of the central line of Fig. 7. The stopper 16 has a protective portion 27 with a central peg 28. The body portion 4 has a throughbore 29 and a plastic top 30 has a central stem 31 which extends into the throughbore 29. The central stem 31 has a blindbore 32 in the end of the central stem 31 remote from the top 30 and a number of barb portions 33 are located on the inside surface of the blindbore 32. The barb portion 33 could be provided by a screw thread formation or annular serrations. The central peg 28 of the protective portion 27 engages in the bore 32 and

is retained in position in the bore 32 by the barbs 33 to prevent separation of the top 30 from the protective portion 27.

5 The stopper 17 is essentially the same as the stopper 16, except that the central peg 31 is formed on a plastic flange 35 and a wooden top 5 covers the plastic flange 35.

10 The body portion 4 is adhesive bonded to the top 30 and/or the stem 31 in stopper 16. On stopper 17, the flange 35 is bonded to the wooden top 5 and the body portion 4 may be bonded to the flange 35 and/or the stem 31.

Fig. 8 shows a ninth example of a stopper in which a stopper 18 is provided with a protective portion 36 which is a coating formed on the cork material of the body portion 4. Fig. 8 shows that the protective portion 36 only extends around the end of the body portion 4 remote from the plastic or wooden top 5.

15 Figs. 9 and 10 show first and second examples of wine corks 41, 45 having protective portions 42, 48 respectively. Wine corks generally have a relatively high compressibility for the cork material, typically in the region of 6 mm. Hence, when the cork is compressed it is desirable to facilitate radial compression of the section of the protective portion on the end of the cork.

20 Fig. 9 shows a first example of a cork 41 in which an end 40 is rounded to permit radial compression and recovery of protective portion 42 when the cork 41 is inserted into a bottle. The protective portion 42 may be applied to the end 40 by a coating technique.

25 Fig. 10 shows a second example in which a cork 45 has a central recessed section 46 with a circumferential groove 47 around the end of the cork 45. The protective portion 48 is applied to the end, typically by a coating technique, and the shaped end of the cork 45 permits radial compression of the protective portion 48 as the cork 45 is compressed.

30 An advantage of the invention is that it combines the holding ability of the cork material to hold a stopper within a bottle mouth while at the same time providing a seal portion which helps reduce the likelihood of the product within the bottle coming into contact with the cork material of the stopper and hence 35 reduce the likelihood of the product/cork interaction and corresponding degradation of the product as well as possible discolouration of the product.

35 In addition, it reduces the likelihood of the product coming into contact with the cork material which may contain bacteria, mould or other contaminants.

40 Modifications and improvements may be incorporated without departing from the scope of the invention.

## 55 Claims

1. A closure for an opening in a container comprising

a body portion comprising a cork material, and a protective portion; wherein the body portion is adapted to retain the closure in said opening and the protective portion substantially prevents the contents of the container contacting the body portion of the closure.

2. A closure according to Claim 1, wherein the protective portion comprises a resilient material.
3. A closure according to Claim 1 or Claim 2, wherein the protective portion comprises a seal profile which engages with the inside walls of the container.

4. A closure according to any of the preceding Claims, wherein the cork material is adapted to be compressed by said opening of the container.

5. A closure according to any of the preceding Claims, wherein the closure further comprises fixing means to retain the protective portion on the body portion.

6. A closure according to Claim 5, wherein the fixing means comprises an adhesive. 25

7. A closure according to Claim 5, wherein the fixing means comprises a projection on the protective portion which engages with a corresponding recess in the body portion to fixedly attach the protective portion to the body portion. 30

8. A closure according to Claim 7, wherein the fixing means further comprises an adhesive to retain the projection in the recess. 35

9. A closure according to Claim 7 or Claim 8, wherein the fixing means further comprises projections on the inside of the recess which engage the projection on the protective portion to resist withdrawal of the projection on the protective portion from the recess in the body portion. 40

10. A closure according to any of the preceding Claims, wherein the closure includes means to permit radial compression of the protective portion during compression of the cork material. 45

11. A closure according to Claim 10, wherein the means to permit radial compression of the protective portion comprises a shaped formation on an end of the body portion. 50

12. A closure according to Claim 11, wherein the shaped formation is on the innermost end of the body portion. 55

13. A closure according to any of the preceding Claims, wherein the body portion comprises a top cover which permits the closure to be manually removed from the container by a user. 5

14. A closure according to Claim 10, wherein the top cover has a projection which extends through the cork material to engage with a corresponding projection on the protective portion to fixedly attach the protective portion to the body portion. 10

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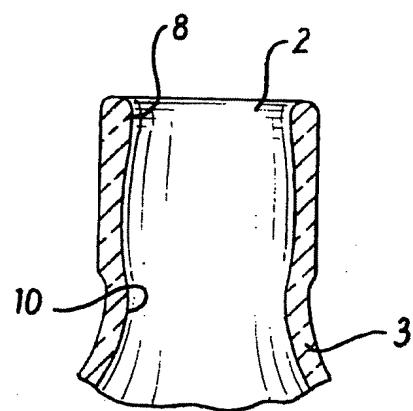
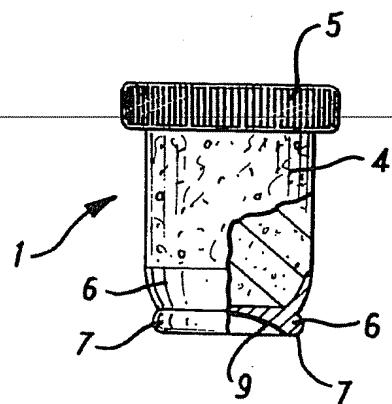
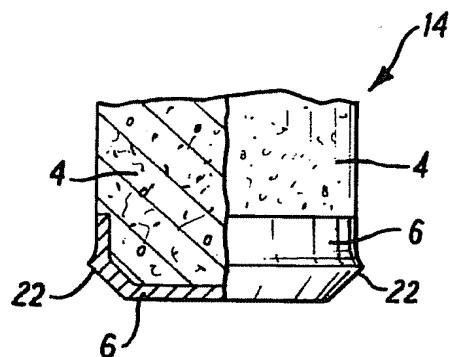
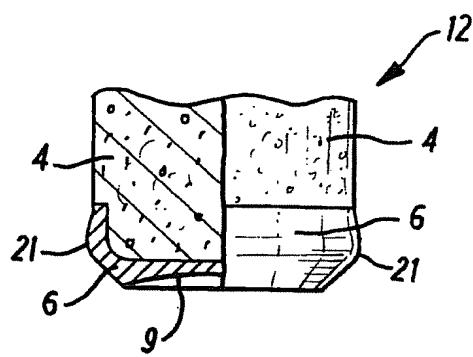
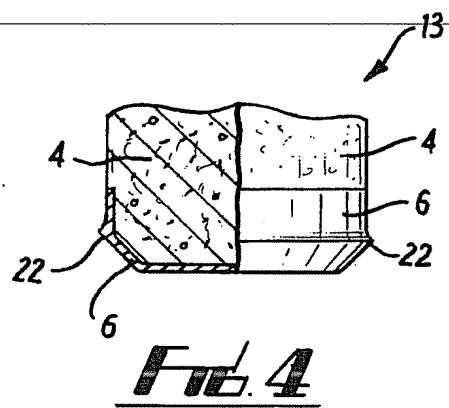
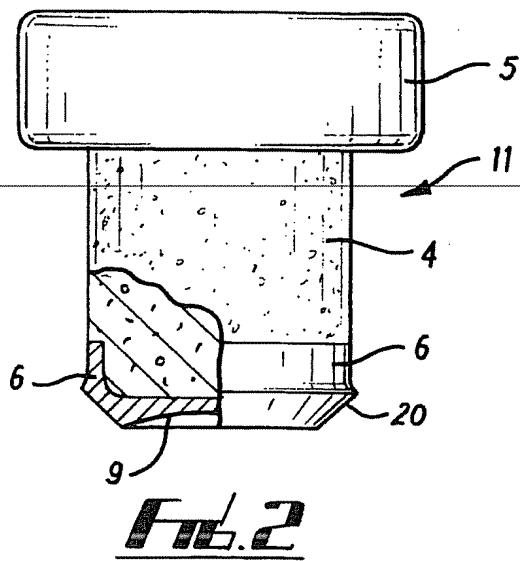
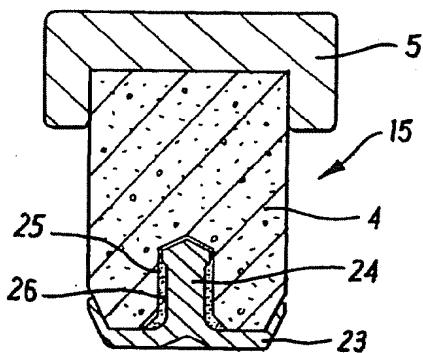
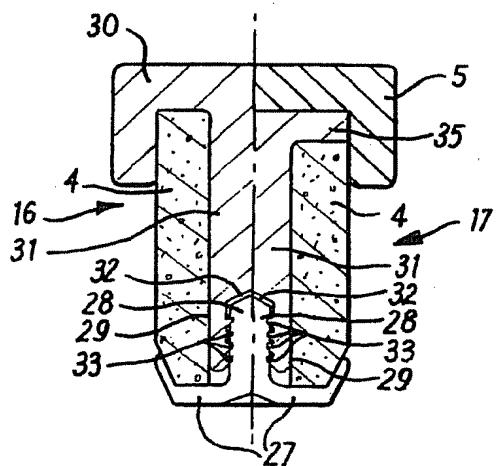


Fig. I

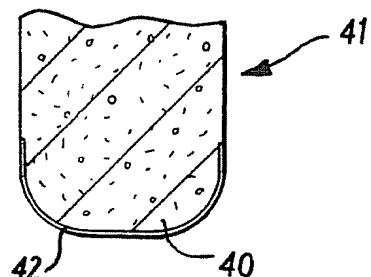




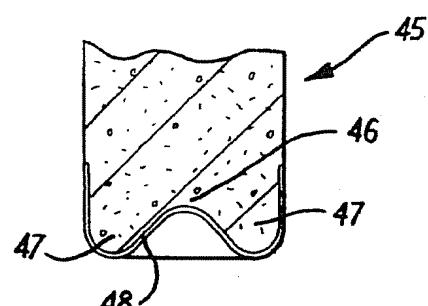
**Fig. 6**



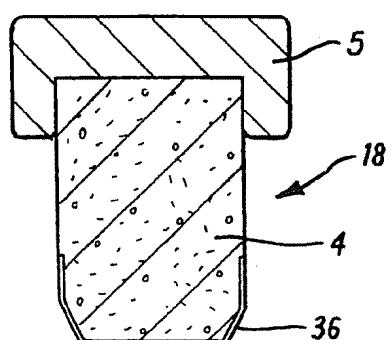
**Fig. 7**



**Fig. 9**



**Fig. 10**



**Fig. 8**